of the females, and the corresponding differences between the penis-sheaths of the males.

In a future note I hope to record the results of my attempt, made six years ago, to find reliable distinctions between these two species in their larval and pupal stages.

EXPLANATION OF PLATE I.

Figs. 1, 4. Genitalia of ♀ *E. pinicolana* and *E. buoliana*, '*a*' being the canal.
,, 2, 5. Ædœagus (penis-sheath) of ♂ *E. pinicolana* and *E. buoliana*, dissected out.
,, 3, 6. Genitalia of ♂, with ædœagus ('*b*') *in situ*.

Cœnobia rufa, Hw., ab. fusca, n. ab.

By EUSTACE R. BANKES, M.A., F.E.S.

Forewings dark fuscous, somewhat tinged with red. Hindwings dark grey, paler towards the base. The usual black dots on both fore- and hindwings are either visible or traceable. The head, thorax, cilia, etc., are proportionately dark as compared with the type.

I have taken this interesting aberration, which differs from the type in its remarkably dark colour, very sparingly of recent years in the Isle of Purbeck, Dorset, among some hundreds of *Coenobia rufa*, which have included examples of ab. *pallescens*, Tutt, and ab. *lineola*, Stph., as well as typical specimens and individuals of every intermediate shade between these last and the darkest representatives of ab. *fusca*. Hitherto I have not come across any females approaching the colour of the form under notice, but it would be rash to assume from this fact that ab. *fusca* is confined to the male sex, for, in my experience, females are rarely met with, and of them my captures have only numbered eighteen. It may be mentioned, in passing, that all have been taken at dusk or late dusk, and all, with possibly one or two exceptions, on the wing, and, curiously enough, seven of them were secured on the rather cool and windy evening of August 2nd, 1905, when my total bag of *C. rufa* only included 26 individuals!

I have failed to find any published reference to this extreme form, or to obtain any information of its occurrence elsewhere.

A close acquaintance with *C. rufa*, extending over some years, has convinced me that, in the spots in the Isle of Purbeck where I have found the imago most numerous, the larva must feed in the stems of *Juncus effusus*, though this conviction still awaits the confirmation of positive proof.

Variation of Aglais urticæ.

By (Rev.) G. H. RAYNOR, M.A.

Some dozen years or more have now elapsed since my very good friend Mr. W. H. Harwood, of Colchester, drew my attention to the possibilities of this species in the way of variation. Since then I have bred it in large numbers every year, and have also had the privilege of seeing all the remarkable varieties reared by Mr. Harwood. After studying the species for so long a period, I realised about a year ago that it was high time to evolve some order out of the chaos, in the way of arranging the specimens I possessed. With a view to accomplishing this, I did what is absolutely necessary for the successful study of any species, *i.e.*, I got a thorough mental grasp of all the

markings that constitute the "tout ensemble" of the insect, and to each of these I proceeded to assign a Latin name. After all, the markings (liable to vary) are but few and simple. Each of the three large black blotches along the costa of the forewings I have termed a "macula"; the large one in the centre of the inner margin is a "nota"; and to the two smaller ones in the central area the name of "puncta" is appropriately given. The outer margin is naturally termed the "margo," and the blue lunulated spots within it "guttæ." These complete the markings of the forewings. The outer margin of the hindwings also has a black edging which contains blue markings similar to the "guttæ," but which, for the sake of distinction, are here termed "lunulæ." The only other variable portion of the hindwings is the central, red, transverse belt, which at once suggests its parent-word "balteus." If those of your readers who have followed me so far, and wish to understand the accompanying table, will get these Latin names well into their minds, I think they will find but very few difficulties in their way; but, before coming to the "scheme," I should perhaps say that in it "infra" refers to the upper surface of the hind-wings, and "subtus" to the underside of the insect; whereas "dorsum" represents the inner margin, and "tornus" the point of junction between this and the outer margin.

In the first place I append an alphabetical list, with full references and descriptions of the 21 (really 20) varieties already described by various authors, only premising that *caschmirensis* = *rizana*, and, having priority, causes *rizana* to disappear.

atrebatensis, Boisd., "Revue et Magasin de Zool.," 1873, p. 409, pl. 17, fig. 1. *Ichnusoides*, South, "Ent.," xxii., p. 218, t. 8, fig. 2. *Urticae* ab., Hb., 549-50; Kirby, "Handbk.," i., 1894, p. 91, fig. 3 (ut ab. a, sed al. post. totis infuscatis) = like *ichnusoides* (of Sélys), but with hindwings entirely fuscous.

caerulapicata, Raynor, "Ent. Rec.," xviii., 298, "with pale chalky-blue apex to forewings."

caschmirensis, Kollar, "Hügel's Kaschmir.," vol. iv., p. 442 (1844), t. 9, figs. 3, 4; Nicév., "*Butts. Ind.*," ii., p. 233 (major, obscurior, al. ant. sine mac. caerul.) = a large dusky form, without blue spots on forewings.

chinensis, Leech, "Butts. China," p. 258, t. 25, fig. 1. Var. *thibetana*, Aust., "Nat.," 1898, p. 201 (major, saturatius fulva, al. margine toto nigro, caeruleo-maculata) = deeper tawny, with entirely black margins, spotted with blue.

conjuncta, Neub., "Soc. Ent.," xix., 170 (1905).—Agrees in a general way with ab. *atrebatensis*, B., but all three costal blotches are united, forming a continuous black stripe in which not at atom of the ground colour remains. Bred by Dr. Dannenberg in a low temperature. Locality not stated.

connexa, Butler, "Proc. Zool. Soc. Lond.," 1881, p. 851; Leech, "Butts. China," p. 258 (al. ant. fascia media nigra) = forewings with central black fascia. Tutt, *Brit. Butts.*, 1896, p. 336, says, "A Japanese local form, with the inner marginal spot united with the costal, forming a central transverse band. Almost identical with *polaris*, except for its brighter colour."

dannenbergi, Neub., "Soc. Ent.," xix., p. 170.—Inclining towards ab. *ichnusoides*, Sél. The blue marginal spots of both forewings and hindwings replaced by spots of a decided straw-yellow colour, those of the hindwings being produced as wedges towards the margin, and with stronger black dusting between them. Underside unicolorous black, the yellow spots forming a broad yellow marginal band. Bred by Dr. Dannenberg. Apparently the result of a temperature experiment.

discolor, (Hein.), Rühl, "Gr.-Schm.," i., p, 778. "Ground colour dark ochreous-yellow; the blue marginal spots present on both wings; border black. Fore-wing with three black costal spots, separated by yellowish spots; a white spot beyond the outer black one; a large black spot not far from the inner margin, without a yellowish one beyond it; two black spots in the middle of the wing. Hindwing broadly black at the base; a muddy ochreous-yellow band

between the base and the border. Underside forewing pale ochreous-yellow, with black-brown costal spots. Basal half of hindwing clouded with blackish." Tutt, *Brit. Butts.*, 1896, p. 336, says, "Ground colour not reddish as in the type, but of a dark ochre-yellow."

ichnusa, Bon., "Descr.," t. 3, fig. 2; Dup., i., 23, 4; B., *loc. cit.*, 24, 2; Hb., 840; Tr., x., 1, 21; Rbr., "Ann. S. Fr.," 1832, t. 7, fig. 3 (saturatius fulva, al. ant. mac. duabus med. nullis) = deeper tawny, the two median spots on the forewings being absent,

ichnusoides, Sélys, "Cat. Lep. Belg.," 1837, p. 18; "Compt. Rend. Soc. Ent. Belg.," 1874, p. 37; Lambricho, ib., "Ann.," xxi. (1878), p. 9, t. 1, figs. 4, 5 (al. ant. maculis 2 et 3 costal. conjunctis, mac. med. nullis, subt. obscurior) = second and third costal blotches on forewings coalescing, no median spots; underside more dusky than usual.

ladakensis, Moore, "Ann. and Mag." (5), i., 1878, p. 227; "Yark. Miss.," p. 2, t. 1, fig. 2; Nicév., "Butt. Ind.," ii., p. 234 (minor, al. fasc. exter. flava; al. ant. sine mac. caerul.) = a small form, with yellow outer margin; no blue spots on forewing.

nigricaria, de Moffarte, "Miscell. Ent.," Oct. 1, 1895, p. 122, "with black hindwings." Redescribed and figured by Haverkampf, "Ann. Soc. Ent. Belg.," xlviii., p. 186, tab. 1 (1904) = *nigra*, Tutt, *Brit. Butts.*, 1896, p. 335. Hindwings entirely black = *nigrita* Fickert, "Journ. Württemberg Nat. Hist. Soc." (Stüttgart, 1897, p. 68). Hindwings entirely brown-black, with merely slight traces of yellowish marginal spots (Fickert, "Jahresb Ver. Nat. Württ.," liii., pl. lxviii [1897], obviously = *nigra* of Tutt), and is apparently the result of a temperature experiment.

nixa, Grum., "Mém. Rom.," iv., p. 426; Rühl, 354 (mac. caeruleis anter. subnullis, al. post. margine exter. latiore) = forewings with blue spots almost obsolete; hindwings with broad outer margin.

osborni, Donck., "Feuille des jeunes Nat.," xi., p. 33, pl. 1, fig. 4.—Tutt, *Brit. Butts.*, 1896, p. 336, says, "The black costal spots of the forewings, with a broad ochre-yellow edging, form a single long and broad stripe, stretching from the outer margin to the basal area. The outer margin ochre-yellow with black stripes, in which both the small black spots and the upper half of the inner marginal blotch are absorbed. Hindwings brown, with ochre-yellow inner margin. The outer margin of the ground colour, the blue marginal lunules very pale (in the forewings absent)."

polaris, Staud., "Cat.," ed. 2, p. 16. *Urticae*, Staud., "Stett. e. Z.," 1861, p. 345 (al. ant. mac. dors. cum mac. cost. saepius conjunctis, obscurior) = forewings generally having dorsal and costal spots united. A dusky form.

pygmaea, Rühl, "Gross Schmett. Pal.," i., p. 778—Tutt, *Brit. Butts.*, 1896, p. 336, says, "Small, half-fed examples. This form bears the same relation to *A. urticae*, that ab. *ioides* does to *V. io.*"

rizana, Moore, "Proc. Zool. Soc. Lond.," 1872, p. 559; Nicév., *loc. cit.*, p. 234 (sequ. var. similis sed major) = similar to the following variety (*caschmirensis*), but larger.

salmonicolor, Raynor, "Ent. Rec.," xviii., 298. "With salmon ground colour."

sélysi, Donck., "Feuille des jeunes Nat.." xi., p. 33, pl. i., fig. 42.—Tutt, *Brit. Butts.*," 1896, p. 336, says, "Differs from *urticae* in the smaller size of the inner marginal blotches of the forewings, in the complete failure of the black spots, in the three costal blotches of the forewings not being edged with yellow, in the faintness of the blue lunules in the outer margin of the forewings, and in the complete failure of the same on the hindwings.

turcica, Staud., "Cat.," ed. 2, p. 16; "saturatius fulva," = deeper tawny. Tutt, *Brit. Butts.*, 1896, p 335, says, "Intermediate between typical *V. urticae* and var. *ichnusa* in colour; the inner marginal spot, and two central spots, are absent" = *turcicoides*, Staud. = *urticoides*, Alph., "Iris," vii., p. 303 (eadem cum praecedente, sed duplo minor) = same as preceding (*turcica*) but only half its size.

urticoides, Fisch. v. W., "Ent.," v., p. 123 (1851).—Staudinger says "Forma pygmaea" = a small form. Tutt, *Brit. Butts.*, 1896, p. 336, says, "Extraordinarily small (only 29-34mm.), brilliantly coloured, and somewhat intermediate between var. *turcica* and the type."

In the subjoined scheme, or table, I have analysed, and arranged according to their position, the above-named varieties, placing them in the left column, and opposite to them I have placed 30 aberrations

which I here name and describe for the first time—nearly all from Essex specimens. Of the 24 previously-named forms, the following, at any rate, I know to occur in Britain—*atrebatensis*, *caerulapicata*, *connexa*, *discolor*, *ichnusa*, *ichnusoides*, *nigra*, *polaris* and *salmonicolor*, and of the others *nixa*, *pygmæa* and *urticoides* have almost certainly occurred.

AGLAIS URTICÆ.

UPPER-SURFACE.

GROUND COLOUR.

discolor, dark yellow.
salmonicolor, salmon.
alba, white.
brunneo-violacea, brown-violet.
clarirufa, bright rufous.
fulva, reddish fulvous.
ignea, fiery-red.
latericolor, brick-coloured.
lutea, buff.
rubrochrea, reddish-ochreous.
obscura, dull, dusky-red.
polychloroides, of the colour of *polychloros*.
testudinea, deep, rich, tortoiseshell.

PRIMARIES.

flavotessellata, with pale yellow central area extending from costa to inner margin.
infuscata, with all the dark markings much intensified.
nubilata, with black, cloudy area between 2nd macula and nota.
radiata, with veins (in central reddish area) much blackened.
strigata, with black, horizontal streak, between 2nd macula and nota.

APEX.

caerulapicata, with pale, chalky-blue apex.

MARGINS.

caschmirensis, without blue lunules.
chinensis, with the black margins blue-spotted.
dannenbergi, with lunules straw instead of blue.
ladakensis, with yellow margins without blue lunules.

COSTA.

nigricostata, with narrow black margin to costa.
fulvomarginata, with outer margins edged with fulvous.
griseomarginata, with outer margins edged with grey.
parviguttata, with small blue lunules.
magniguttata, with large blue lunules.
cuneatiguttata, with wedge-shaped blue lunules.

MACULÆ.

ichnusoides, 2nd and 3rd maculæ coalesce; puncta absent.
atrebatensis, 2nd and 3rd maculæ coalesce; hindwings entirely fuscous.
conjuncta, all three maculæ coalesce.
osborni, all three maculæ coalesce, and are edged with yellow-ochre; puncta both absent.
connexa, with complete black median fascia, ground colour normal.
polaris, with complete black median fascia, ground colour dusky.
sélysi, with four maculæ (three along costa, fourth square, and near margin).

PUNCTA.	
chnusa, puncta both absent, ground colour deep tawny.	*magnipuncta*, with large puncta.
	parvipuncta, with small puncta.
	punctijuncta, with joined puncta.
	tripuncta, with three puncta.
	unipuncta, with one punctum.
NOTA.	
turcica, nota (and puncta) absent.	*magninotata*, with large nota.
	parvinotata, with small nota.
DORSUM.	
	nigridorsata, with black streak running from tornus to nota.
SECONDARIES.	
nigricaria, black.	*adumbrata*, with black cloud at top of balteus.
nixa, with broad outer margin.	*infraradiata*, with veins (of hindwings only) much blackened.
	angustibalteata, with narrow balteus.
	latibalteata, with broad balteus.
	magnilunulata, with large blue lunules.
	parvilunulata, with small blue lunules.
SIZE.	
pygmaea, small.	
urticoides, small (29-34mm.), brilliantly coloured.	
UNDER-SURFACE.	
	subtus-lactea, with pale area creamy (instead of ochre).
	subtus-rufa, with pale area rufous (instead of ochre).

This tabular arrangement will, I hope, enable specialists to sort out the different forms of this insect they possess, and when they get a representative series I believe they will be convinced that I am not guilty of refinement in assigning such a large number of new names, but that every form named is worthy of separation from the type.

Many of them are both rare and beautiful, notably *alba*, *igmea*, *discolor*, *nigricaria*, *ichnusoides*, *atrebatensis*, *conjuncta*, and *caerulapicata*. It is, beyond all controversy, a most glorious insect, and, according to my experience, maintains its pristine lustre undimmed for many years, provided that it has never been subjected to any chemical fumes. Personally I avoid all such deleterious agents as ammonia and cyanide, and kill by puncturing with a pen-nib steeped in nicotine.

In conclusion, I feel I must heartily thank the Rev. G. Wheeler, Mr. Louis B. Prout, and Herren Standfuss, Federley, and Gillmer, for their valuable assistance in the matter of nomenclature, and may also add that I shall always be pleased to help any of your readers, so far as I can, in matters connected with this species.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.E.S., F.Z.S., etc.

(*Continued from* vol. xx., p. 260.)

4. DOLICHOPODA AZAMI, Saulcy.

Differs from its congeners as shown in the table of species. According to Azam, this species occurs in November in various caves and grottos in Provence, as the Grotte des Chauvesouris, near Châteaudouble, in crevices in the Clue de Chabrières, Font de Sao.